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THE HOLOTYPE OF *NATALUS STRAMINEUS* GRAY (MAMMALIA: CHIROPTERA: NATALIDAE)

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Abstract.—The description of *Natalus stramineus* Gray was based on an unspecified number of specimens of unknown provenance. We review the critical specimens and their history in the mammal collections of the British Museum (Natural History). We identify the holotype of *N. stramineus,* and we believe that Goodwin (1959) was correct in claiming that it originated in the West Indies rather than in South America.

In the original description of *Natalus stramineus,* Gray (1838) did not specify the number of specimens examined and indicated that he did not know the origin of his material. Later Gray (1843) said that he had a fluid-preserved specimen from South America and another (presumedly dry) from St. Blas, North America; this information was repeated by Tomes (1856). Dobson (1878) listed a male in alcohol from Brazil, an unsexed skin from South America, and a male in alcohol from Dueñas, Guatemala. Authors subsequent to Dobson gave Brazil as the type locality of *N. stramineus.* Goodwin (1959), however, suggested with good reason that the type came from the West Indies, not Brazil as previously supposed. When he shifted the type locality from Brazil to the West Indies, Goodwin synonymized Shamel's (1928) West Indian *Natalus dominicensis* with *N. stramineus,* and renamed the Brazilian population *N. stramineus natalensis.* Goodwin (1959) argued correctly that the specimen in the British Museum (Natural History) he believed to be the holotype of *N. stramineus* was the same as that listed by Gray (1843) and Tomes (1856) from South America and by Dobson (1878) from Brazil. Following Goodwin (1959), the nomenclature of *N. stramineus* appeared stable, but some authors (Carter & Dolan 1978, Honacki et al. 1982) have continued to list Brazil as the type locality. We intend to set the record straight in this report.

The Evidence

In 1971, Handley examined the putative holotype of *N. stramineus* in the British Museum, reviewed its history in collections of the Mammal Section, and attempted to determine its provenance. However, there are alternative possible types or syntypes of *N. stramineus* in the British Museum that represent other populations, and the situation is complicated by apparent multiple relabeling of specimens. Because the clues leading to recognition of the holotype and a second specimen reported by Gray in 1843 come from a number of sources, we list the evidence in considerable detail.

Gray 1838.—Gray (1838:496) described *Natalus* as a new genus and *N. stramineus* as a new species. He gave no morphological measurements, but indicated that he actually had a specimen by his statement, "inhabits _____? British Museum." By implication he had at least one specimen of unknown origin.

Gray's mss. catalogue.—Soon Gray had another specimen, as his undated handwritten catalog of Primates and Chiroptera in the British Museum (referred to in literature as "Gray's Mss. Catalogue") shows the following entry: "69./ Vespertilio lon-

gicaudatus, *Gray Mss/* Natalus stramineus Gray Mag Zool & Bot. 1837 [sic]/ a. S. America/ b. St. Blass/ Purchased of Mr. Gould/ 42.8.17.10."

Museum register 1842.—The museum register has the following information for number 42.8.17.10 (in the registry system of the Mammal Section this was the tenth specimen registered on 17 August 1842): "Vespertilio/ St. Blas/ Purchased of Mr. Gould,/ Cheirop. 69b."

Gray 1843.—The data from Gray's *mss.* catalogue and the museum register were repeated in Gray's published "Catalogue" (1843:28) with important additions:

> "The Natale. Natalus stramineus, *Gray, Mag. Zool. and Bot.* II. 14. Vespertilio longicaudatus, *Gray, Brit. Mus.*
> *a.* In spirits. South America.
> *b.* N. America, St. Blas."

In the British Museum copy of his 1843 "Catalogue," Gray inked the figure "69" in the margin beside specimen "*a,*" referring back to his "Mss. Catalogue" number. Recognition of handwriting in books, papers, and specimen labels in the Mammal Section of the British Museum is a relatively simple task because the Section has preserved samples of handwriting of all who have worked there.

Evidently, by August 1842, there were only two specimens of *N. stramineus* in the British Museum. The facts that specimen "69"*a* was from an indefinite locality and that it was preserved in spirits are two important bits of information. Clearly the holotype of *N. stramineus* must be "69"*a,* because *b* was from a definite locality, and Gray's original reference (1838) specified "inhabits _____? British Museum."

Tomes 1856.—Tomes (1856:176–178, pl. 43) redescribed the genus *Natalus* and the species *N. stramineus* in great detail. He concluded with the statement, "The whole of the above [description] has been taken, by the kind permission of Dr. Gray, from the two examples mentioned in his Catalogue [1843], and the following are their dimensions. The first column [No. 1.] refers to the specimen in spirits from South America, and the second [No. 2.] to the one from St. Blas, North America." A table of measurements of the two specimens followed. Plate 43 is colored, shows great detail, has accurate proportions, and seems to have been drawn life size. Although its source was not specified, measurements taken from the figure on Plate 43 coincide closely with those listed by Tomes for his specimen No. 2, the one from "St. Blas." Thus, at the time of Tomes' writing there continued to be only two specimens of *N. stramineus* in the British Museum. The specimen labeled "South America" and preserved in spirits must be the holotype Gray described in 1838. It is the larger of the two. The other, evidently dry, labeled "St. Blas," and figured by Tomes (1856:pl. 43), is smaller.

Dobson 1878.—Dobson (1878:343) listed three specimens of *N. stramineus* in his catalogue of Chiroptera in the British Museum and gave the distribution of the species as "Brazil; Central America." The first two specimens were listed as:

a. ♂ ad., al.	Brazil.
b. ad. sk.	South America.

The third was listed on the same page under Var *a.* as:

a. ♂ ad., al.	Dueñas, Guatemala. O. Salvin, Esq. [C.].

Dobson (1878:344) gave a table of external measurements of two of the specimens. The first column is headed "*N. stra-/mineus*" and the second, "Var *a.*" The measurements under *N. stramineus* must have been of either Dobson's specimen "*a*" or "*b.*" Some time later, Thomas wrote "type" in the margin beside specimen "a. ♂ ad., al. Brazil" in the Mammal Section's copy of Dobson's catalogue.

Cabrera 1958.—Cabrera (1958:73) restricted the type locality of *N. stramineus* to Lagoa Santa, Minas Gerais, Brazil, on

the basis of Winge's (1892) report of the first definite locality for the species from the country where Dobson (1878) said the type had originated.

Goodwin 1959.—Goodwin (1959:4–5, 16), on the basis of measurements and cranial morphology, stated that the holotype of *N. stramineus* matched representatives of populations inhabiting the Lesser Antilles. As is evident from material in the mammal collections of the National Museum of Natural History, Washington, D.C., the Brazilian population differs sufficiently from that of the Lesser Antilles to make confusion of specimens between the two populations unlikely. On the same basis, Goodwin (1959) ruled out Venezuela, Trinidad and Tobago, Central America, and México as possible origins. He said that Gray's type could not have come from Brazil or anywhere else in South America and proposed restricting the type locality to the island of Antigua, British West Indies.

Carter & Dolan 1978 and subsequent reports.—Carter & Dolan (1978) said that of the two specimens of *Natalus stramineus* reported by Gray (1843:23), the one in fluid labeled Brazil was the only identifiable one remaining. They said it was an unnumbered adult male in alcohol (with skull removed), and gave the type locality as Lagoa Santa, Minas Gerais, as restricted by Cabrera (1958: 95). Because they reported this specimen as unnumbered, their information must have come from Carter's visit to the British Museum in 1966. In 1970 this specimen was registered as No. 70.2324. Presumably, it was during 1966 and not when they revisited the British Museum in 1976 that Carter & Dolan (1978:11) were unable to find the second specimen listed by Gray (1843) from "N. America, St. Blas." Apparently misled by Gray's (1843) mention of two specimens, Carter & Dolan (1978) presumed them to be syntypes. They also commented that Goodwin (1959), in disagreement with Cabrera (1958), designated the type locality as Antigua, Lesser Antilles. They probably followed Cabrera's restriction of the type locality to Lagoa Santa, Minas Gerais, because of Dobson's jar label, which said Brazil. Hall (1981) followed Goodwin's designation of Antigua; but Honacki et al. (1982) followed Cabrera's (1958) restriction.

The specimens.—All three specimens listed by Dobson were still in the British Museum in February 1971 when Handley examined them, and in October 1987 when Gardner examined them. Numerous other specimens of *Natalus stramineus* now in the British Museum bear dates later than 1878, have definite locality data, and are not relevant in this discussion. Presuming that it still exists, the holotype of *N. stramineus* must be one of the three specimens listed by Dobson (1878:343). The oldest label attached to each of these three specimens was written by Dobson himself. Presumably, he was responsible for changes where the label data differed from those published by Gray (1838, 1843) and Tomes (1856).

The male in alcohol with skull removed and cleaned is labeled "Natalus stramineus Gray/ (G. E. Dobson)." This specimen was finally registered in 1970, and at that time the jar label was emended to read: "Type/ ♂/ Natalus stramineus, Gray/ 70.2324/ Brazil." Unfortunately and unaccountably, 15 of the 20 finger bones and both tibiae of this specimen have been broken. Otherwise its condition was reasonably good in 1971.

The second specimen is an unsexed, dry skin with skull inside that lacked a registry number in 1971. It is labeled "Natalus stramineus, Gray/ (G. E. Dobson) ? (type) South America," all in Dobson's handwriting.

The third specimen, number 75.2.27.72, a male in alcohol with skull removed and cleaned, was labeled "Natalus stramineus/ (G. E. Dobson)/ Dueñas, Guatemala/ O. Salvin, Esq." It agrees morphologically with other specimens of *Natalus* from Guatemala, and because there is no reason to doubt

the accuracy of its label information, it can be eliminated from the search for the holotype of *N. stramineus*.

Discussion

The specimens.—The situation thus posed is of a single specimen of *N. stramineus* described by Gray in 1838 without data, two specimens in the period 1842–1856 with data (Gray 1843, Tomes 1856), and two specimens in 1878 (Dobson) with different data. Correlation of the measurements (Table 1) from Tomes' (1856) table and plate, Dobson's (1878) table, and the two specimens in the British Museum in 1971 with the information published by Gray (1838, 1843), Tomes (1856), and Dobson (1878), and with the present label data of the specimens leads to the conclusion that only two specimens have been involved throughout, that the label data for the holotype changed at least twice, and that neither specimen was properly labeled in 1971 (Table 2).

Table 1.—Measurements (in millimeters) of the holotype (BM 70.2324) and contemporaneous specimen (BM 42.8.17.10) of *Natalus stramineus* from a table in Tomes (1856:178), plate XLIII in Tomes (1856; measured by Handley), a table in Dobson (1878:344), and the specimens in the British Museum (Nat. Hist.) measured by Handley in 1971. Measurements in brackets indicate approximations.

Measurement / Specimen	Tomes (1856)		Dobson (1878)	Specimens 1971
	Table	Plate	Table	(left/right)
Forearm				
70.2324	37.5		37.9	38.3/38.1
42.8.17.10	35.4	36.5		[35.9]/
Tibia				
70.2324	20.1		19.1	[19.0]/
42.8.17.10	16.9	17.2		18.0/
Third finger				
70.2324	76.2			71.7/72.4
42.8.17.10	69.9	66.0		67.3/
Fourth finger				
70.2324	55.0			54.0/53.5
42.8.17.10	48.9	50.5		51.6/

The coincidence of measurements is too great (see Table 1) to suggest other than that the "*b*" of Gray (1843), specimen BM 42.8.17.10 from St. Blas, "No. 2" and plate 43 of Tomes (1856), "*b*" of Dobson (1878), and the unregistered specimen labeled "South America" in 1971 are all the same. This specimen, which agrees morphologically with *Natalus* from western México, is the other implied "syntype" Carter & Dolan (1978) were unable to recognize because it was labeled "South America" when Carter examined it in 1966. Evidently Dobson, or someone else between 1856 and 1878, confused the data and transferred "South America" from the holotype (which originally had been without locality data) to the San Blas specimen. As of 1971, no bat in the British Museum was labeled "St. Blas" or "42.6.17.10."

The possibility exists that specimen "*a*" of Dobson (1878) from "Brazil" (presently no. 70.2324) was a new specimen obtained sometime between 1856 and 1878, and had nothing to do with Gray's type of *N. stramineus*. However, again based on the coincidence of measurements given by Tomes (1856) and Dobson (1878), and those of specimen BM 70.2324 (Table 1), as well as the mode of preservation, the evidence is compelling that BM 70.2324 is the specimen Gray had at hand in 1838 when he described *N. stramineus*.

The labels.—Having established that Gray (1838) had only one specimen before him when he described *N. stramineus*, and having identified that specimen from among others now in the British Museum, we attempt to account for the several changes in localities assigned to it (see Table 2). We start with Gray's original statement (1838) that the provenance of the holotype was unknown. One can see how Gray later could have come to label it "South America." Receipt of the second specimen from a definite locality, "St. Blas" (= San Blas, Nayarit,

Table 2.—An outline and chronology of the information available on specimens of *Natalus stramineus* reported by Gray in 1838 and 1843.

Reference	Specimen	Specimen
Gray (1838)	"Inhabits ____?" (holotype of *N. stramineus*)	
Gray (ca. 1842, mss. catalogue)	S. America "Natalus stramineus Gray Mag. Zool. & Bot. 1837 [sic]" 69.a	St. Blass "purchased of Mr. Gould" 42.8.17.10 69.b
Gray (1843)	South America In spirits *a.*	North America St. Blas [Dry?] *b.*
Tomes (1856)	South America In spirits No. 1 in table of measurements	North America St. Blas [Dry?] No. 2 in table of measurements
Dobson (1878)	Brazil In alcohol *N. stramineus* in table of measurements *a.*	South America [Dry?] *b.*
Specimen labels (1971)	Brazil In alcohol BM 70.2324	South America Dry Unregistered
Goodwin (1959)	Antigua, Lesser Antilles	
Conclusions herein	Origin unknown [Lesser Antilles] BM 70.2324	San Blas, Nayarit, México 42.8.17.10

México), must have prompted him to assume that the unlabeled holotype also came from somewhere in Latin America and led him to label it, in the broad sense, as from "South America" (a common euphemism for Latin America). If these events are properly reconstructed, this was the first of other erroneous relabelings of this specimen. Emending labels or relabeling, practices at the British Museum that began with Gray and were continued by Tomes, Dobson, and Thomas, have produced some label data that are unreliable or suspect. Another potential problem with Mammal Section spirit specimens is that, in the 19th Century, usually the jars rather than the specimens themselves were labeled, leading to possible confusion between jars or within jars when they contained more than one specimen (e.g., Smith 1971:80–81).

Although we can understand how the holotype of *N. stramineus* could have been erroneously labeled "South America," it is a mystery how Dobson (1878) came up with the label "Brazil" for it. Possibly, when relabeling specimens, Dobson's selection of "Brazil" as the origin of the holotype was influenced by the similarity between the name *Natalus* and Natal, the capital of the Brazilian State of Rio Grande do Norte (eventually to be the type locality of *N. stramineus natalensis* Goodwin, 1959). It seems unlikely that he could have mistaken the handwritten "St. Blas" in Gray's "Mss. Catalogue" for Brazil. Equally unlikely is the possibility that he got new information di-

rectly from Gray. Dobson and Gray overlapped only briefly at the British Museum. Dobson, an army surgeon who came to London in 1873, took up the project of listing the Chiroptera in the British Museum while he continued medical work at Nethley Hospital. Gray suffered a stroke in 1869 and, although paralyzed on the right side, he returned to the Museum after a few months and continued to work there until the latter part of 1874. He died in 1875 (Günther 1912). Besides, if Gray had had new information, surely it would have been used by Tomes. There is nothing to suggest that Dobson's "Brazil" and "South America" localities for two of the three specimens he reported were based on actual information on their origins.

We are not aware of any South American populations clearly assignable to *N. stramineus* except for the widespread Brazilian population Goodwin (1959) named *N. stramineus natalensis*. Cuervo D. et al. (1986) listed *N. stramineus* for Colombia, but indicated neither specimens nor localities. According to Goodwin (1959) the two specimens Sanborn (1941) listed as *N. stramineus* from Trinidad proved to be *N. tumidirostris*. Goodwin (1959) also pointed out that the Guyanan (British Guiana) specimen identified as *N. stramineus* by Jentink (1893:79), Young (1896:44), and Beebe (1919:219), is a *Furipterus horrens*.

Conclusions

Gray (1838) had only a single specimen before him when he described *Natalus stramineus* as a new genus and species. It was an adult male in spirits. Its origin was not known, but we believe as did Goodwin (1959) that it came from the Lesser Antilles (restricted type locality, Antigua). It is BM 70.2324, erroneously labeled "Brazil," and preserved in fluid with skull removed.

The second specimen is a dry skin with skull inside from San Blas, Nayarit, México (= St. Blas, North America), first mentioned in Gray's mss. catalogue, probably in 1842. It is BM 42.8.17.10; but is erroneously labeled "South America" without registry number. It is an example of *N. stramineus saturatus* Dalquest & Hall, 1949.

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